

## **Technology, Education, and Workplace: What Is the Link?**

The economy of the United States has undergone major changes from the 20<sup>th</sup> to the 21<sup>st</sup> Century. These changes have impacted every aspect of our society and our relationships with others, including our educational systems. Technological advances, globalization, and an overall shift in the workforce have made it imperative for our schools to re-examine how they are preparing the youngest members of the population for the world that lies ahead of them. Thomas Friedman, author of "The World is Flat" (2005), and other proponents of forward and creative thinking offer some crucial insights into what our world has become and where we are going. While jobs are being outsourced to other countries daily, we should take note and begin to make changes, or we may fall even further behind.

### **Our Nation in the 20<sup>th</sup> Century**

Looking back on the 20<sup>th</sup> Century, a number of job sectors drove the economy. Manufacturing of a wide range of products and services was in high demand. Technical advances, better machinery, and strong fertilizers helped increase the productivity of crop development. Farming provided enough agricultural products—through livestock, grains, and other major staples of the human diet—to feed the nation. And the mining of coal, iron, and steel helped sustain the economy by providing resources that could be used to create goods for use both inside and outside the United States (U.S. Department of State, 2007).

The 1900s were witness to many economical changes. During the 1950s, people began buying goods that were not available during World War II. This created corporate expansion and more jobs, as the demand for products increased. The 1970s saw a surplus in agricultural products. This brought more money to farmers, but also demanded more government assistance to determine ways to distribute the surplus (U.S. Department of State, 2007).

As the century advanced into the 1980s and 1990s, technology exploded. It moved from base-level computing systems to highly advanced cell phones, hand-held computers, and satellite technology. This new technology runs internet communication, databases, and other information-sharing tools, all allowing communication to take place with people a world away, at the touch of a button. With this technology came even more job opportunities for everyone well-schooled in the use of this technology, from established employees with varied levels of work experience to college graduates. The rise in technology allowed people from all over the world the opportunity to compete for higher-level and high-paying jobs (Friedman, 2005).

The changing economy allowed the population to choose to move into a variety of fields, one of which was manufacturing. In the early to mid 1900s, manufacturing jobs increased and even provided women who had been working from home a place in the workforce, as the need for more employees in factories and on assembly-lines increased. As the century

progressed, however, many of these factory jobs diminished as people were replaced by machines, companies were sent overseas, or the need for certain products disappeared. Production occupations, such as farming, decreased from almost 40 percent to as low as 3 percent. Even goods-producing industries dropped almost 20 percent. The only jobs that continued to grow were those within the service-industry. People who desired to work with finances, real estate, government and even retail trade had their pick of work opportunities. Many of these people came from the manufacturing sector looking for employment (Fisk, 2001).

The changing workforce had dramatic effects on American society and schools. Once the 1980s and 1990s brought more technological advances, the competition for jobs began to take a turn. Skills taught in the schools during the 1950s were no match for the new schools and society of the 1990s. A change needed to be made to get students ready for what they would encounter (Wells & Steptoe, 2006).

### **What this Meant for Education**

Education has always played a major role in how the economy is shaped. There are staggering statistics that demonstrate this point. "In 1900, less than 14 percent of all Americans graduated from high school. By 1999, that figure had increased to 83 percent. In 1910, less than 3 percent of the population had graduated from a school of higher learning. By 1999, the figure was 25 percent. Furthermore, increased education resulted in substantial monetary payoff for the individual worker. Men with college degrees earned 62 percent more and women 65 percent more in hourly compensation than did those with a high school degree at the end of the century (1997). A substantial part of the growth of the economy is attributable to increased education" (Fisk, 2001).

Educational institutions in the 20<sup>th</sup> Century provided opportunities for students to gain skills for what could be considered blue-collar (manual labor) or white-collar (professional, administrative, or managerial) jobs. It could be seen in schools around the United States. School curriculums allowed for more trade-oriented or basic courses for one group; basic math, science, English, and history courses allowed them to easily transition into jobs once they graduated high school. The students who desired to continue their educational studies beyond high school could take more rigorous courses: higher level math and science, foreign languages, advanced placement history. The "tracks" were different, but educational opportunities were available for each group to succeed. There were even business-related courses (typing, computers, accounting) if a student wished to train for a job in this field.

Liberal arts courses added to the curriculum. Art, music, and choral classes allowed students to foster their interests or become masters of their craft. Foreign language programs, on the average, covered four basic languages: Latin, German, French, and Spanish; however, most courses were begun at the middle or high school level and there were not always stringent requirements for mastery of any of these languages to graduate. Based on this fact, as the world was becoming more globally business-oriented, many students could not compete linguistically. This one major barrier in communication would prove to be a major cause of other issues in the future.

At times, historical events had a major effect on education. The 1950s and 1960s brought an increased demand for space exploration, to compete with other countries, thereby pushing more students to increase their studies of mathematics, science, and engineering courses. As the drive to compete with other nations in space travel exploration began to diminish in the 1980s and 1990s, the number of students enrolled in higher level mathematics and science courses followed suit. Other countries continued to advance in these areas, giving them the upper hand in developing technology and their overall business structure. This, in turn, provided even more job opportunities for these countries. Looking ahead, we can see that if the United States does not continue programs that foster a variety of important and life-changing skills, we stand to fall behind (Friedman, 2005).

## **Our Nation in the 21<sup>st</sup> Century**

The 21<sup>st</sup> Century has come about on the tails of globalization. Companies rely on technology that provides immediate results to carry out their day-to-day business transactions, from their office to anywhere in the world, with an internet connection. Products and services are readily transported and traded with overseas partners set on achieving a world-wide goal of sustaining or developing a strong economy. There is a growing interdependence on world markets, but there remains the issue of overproduction and surplus while employment in areas such as farming is on the decline (U.S. Department of State, 2007).

Technology is constantly changing to make everything we do more efficient, in terms of both time and money. There is still manufacturing and agriculture, but many of the tasks that were once performed by humans have been replaced by machines. These changes have drastic implications on the economy and the types and number of jobs available at any given time.

In the 21<sup>st</sup> Century, Americans are competing not just with other Americans, but also with citizens of India, China, or even Japan. Outsourcing is common with major corporations. Jobs are sent to companies overseas, where people will work for less money and perform just as well as their American counterparts (Friedman, 2005).

Because of the fierce competition, American employees need to be versatile, having a wide array of skills that can be adapted to a wider array of job opportunities and tasks. These kinds of people, called "versatilists," are unique individuals. They can apply a greater depth of skills to a variety of situations and experiences. They utilize creative thinking to come up with new solutions to problems and new ideas to make the world run more efficiently and effectively. Overall, companies want employees that can improve the way that work is being done while effectively carrying out the overall goals of the organization. This is what the technology-driven, ever-changing American society is coming to (Friedman, 2005).

## **What This Means for Today's American Schools**

From the 20<sup>th</sup> Century to today, very little has changed in regard to the manner in which schooling is carried out. There are still teachers who lecture and provide few opportunities for students to truly use what they are learning in creative or useful ways, beyond the classroom. The world has changed and the classroom needs to change with it (Wells &

Step toe, 2006).

What do today's schools need? Teaching needs to be brought into the 21<sup>st</sup> Century. Our students need to be ready to join in with the global economy and work in jobs that will help advance our society. To compete, there are a number of important skills that should be honed before they leave the comfort of their high school walls (Wells & Step toe, 2006).

- High competence in traditional academic subjects
- Knowledge of the world
- Creative and innovative skills
- Cross-curriculum thinking
- Good people skills

It is necessary for students to be knowledgeable in a variety of basic subject areas before graduating. These include English, mathematics, science, history and even foreign language courses. The level of competence they have in these subject areas will allow them to compete, or fall behind, when they graduate. Standardized tests, many given in light of No Child Left Behind, focus on reading and math skills. Our schools have begun to focus so much on these areas, where there are still major shortages in learning compared to other countries, and as a result, other subjects are beginning to falter as well (Wells & Step toe, 2006). Students need to push harder and truly grasp all of the subjects they study, as many countries already accomplish this task.

Being knowledgeable about what goes on in the world is a major step toward becoming a more global citizen. To compete with other countries, students need to be literate in global trade and fluent in a foreign language. They also need to be aware of and sensitive to foreign cultures (Wells & Step toe, 2006). Foreign language skills are disastrously lacking in our American youth. Many schools still require only 2 years of foreign language study, many times being offered at the middle or high school level, making it nearly impossible for mastery at any level to take place. And, with the global market focusing more on languages such as Chinese and Arabic, the main course offerings of Spanish, German, French, and Latin are not even allowing the students the opportunity to compete. Some schools are changing this, however, taking on courses in Chinese and even offering language study programs abroad. This is a step in the right direction.

How else must our students change in order to make it in this more global economy? In an age where some schools are still selective about course offerings for different types of students, it is only possible to change our schools if we re-examine what we are doing, what we have done, and where we want to go, and align it with what is going on in the world around us. Standardized tests have become the answer to determining the health of our schools. But what can the students do with basic facts and information if they have not been pushed to put it to use in simulations of real-life situations? Complex thinking and problem solving skills allow students to "think outside the box" and really see what they can do (Wells & Step toe, 2006). These skills, teamed with technology-savvy thinking, will greatly increase a student's ability to adapt to the global economy.

Cross-curriculum thinking is possibly one of the most innovative ways to make it in a global economy. YouTube and Google are two examples of what happens when you combine disciplines. Inventors of these two popular internet tools took mathematics and art and combined them in a way to make a product that the public would use on a regular basis. These kinds of innovative ideas, taken across the curriculum, can easily be translated into what students can accomplish in their own schools (Friedman, 2005).

Our society has become increasingly more team-oriented when it comes to getting jobs accomplished. It is imperative that our students be educated in manners of developing good people skills. They will be required to work with groups of people from varied educational and cultural backgrounds. In order to effectively accomplish what companies require, they will need to be team players. This ties in with thinking globally and truly learning about and understanding other cultures, personalities, and learning styles (Wells & Steptoe, 2006).

The bottom line: Our schools must become global to compete with the real world. Thomas Friedman (2005) explains that there needs to be an adapting of business processes, study habits, and innovative ideas to go along with the "flattening" of the world, where everything is becoming more interconnected and collaborative. We need to think about what will make these students stand out from the rest. Teachers must allow for creativity to take place in their classrooms. Hands-on projects, real-life simulations, rigorous language programs, strong academic courses, and tasks that require problem-solving and creative thinking are ways to help keep our students involved and in fierce competition with other students and people from around the world. Only then will our students be better prepared for what awaits them in the "real world (Friedman, 2005)."

Maybe even more important than what the schools need to do is what the parents need to do. Parents must step up and be challenged to prepare our students for the global world. Families that encourage their children to work hard, reach for their goals, and realize their true potential have children who are better prepared for life beyond the classroom. Parents and schools can do much to shape the children of today, and make them truly see what they are capable of (Friedman, 2005).

## **The Road Ahead**

Shirley Ann Jackson, president of the American Association for the Advancement of Science and president of Rensselaer Polytechnic Institute, offers deeper insights into what she has seen happening with our global world. "The sky is not falling, nothing horrible is going to happen today. The U.S. is still the leading engine for innovation in the world. It has the best graduate programs, the best scientific infrastructure, and the capital markets to exploit it. But there is a quiet crisis... that we have to wake up to. The U.S. today is in a truly global environment, and those competitor countries are not only wide awake, they are running a marathon while we are running sprints. If left unchecked, this could challenge our preeminence and capacity to innovate" (Friedman, 2005, p.253).

World globalization has created newer and greater job opportunities. Having imagination, strong academic skills, and the adaptability to work with a wide background of people, technology and ideas is necessary for people to excel in this ever-advancing global

economy. Our schools have a responsibility to prepare students for what opportunities await them. (Friedman, 2005). After all, Friedman (2005) states, "we have within our society all the ingredients for American individuals to thrive in this world, but if we squander those ingredients, we will stagnate" (p.306). We cannot afford to let this happen, after everything we have accomplished. Our children will be the next individuals to take our society and continue to make it great, if they have the tools to accomplish that.

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